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A SUGGESTION FOR MEETING INDIVIDUAL DIFFERENCES

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At the outset we shall assume that there is no question of the existence of individual differences among school children. Such an assumption is based on facts shown in all studies on retardation, acceleration, and elimination in the records of progress in all subjects as expressed by teachers' marks, and in all tests, be they intelligence, achievement, or of whatever nature. Hence the assumption may rest as an established fact.

Various plans of caring for pupils in accordance with their native capacities and acquired abilities have been suggested. We shall not endeavor to recount these plans, but will assume that many of them have really contributed to the solution of the problem, and that none of them has more than scratched the surface in dealing with it. Pupils have been, and are being classified in some schools according to ability as determined (1) by teachers' judgment, (2) by cumulative records of earlier progress and indicated interests, (3) by so-called intelligence tests with intelligence quotients determining the classification. This distribution places the better pupils in groups with their equals in capacity and likewise groups the poorer pupils by themselves and the average pupils by themselves. Of the three methods suggested above, we incline, wherever records are available, to the use of cumulative records as the chief determining factor for classifications. Intelligence tests are so often given under conditions that tend to vitiate the results that great care needs to be exercised in using them for determination in the case of a single individual. One adult who had taken the Otis Test twice scored a difference of over one hundred points in the two tests. He had apparently misunderstood the directions in the first test. If such cases happen with trained adults, what is likely to happen in the case of the untrained child? Where

cumulative records are not available, on the other hand, intelligence tests may be utilized. However, a combination of the three possible means—teachers' judgment, cumulative records, and intelligence scores—is far to be preferred to exclusive dependence upon any one of them.

The general matter of classification according to ability is basic for any real attack on the problem of individual differences. We have to handle pupils in classes varying in size from fifteen to fifty. In order to teach all these pupils effectively, there should be grouping according to narrow limits of homogeneity. Plans for individual progress within the group can only be properly supervised when the groups have enough natural ability, sufficient preliminary training, and a sufficiently similar outlook toward progress in the future as to furnish the opportunity for dealing with the same problem intelligently by all of the individual members of the group.

Another method of providing for individual differences widely hailed as an educational panacea is the extensive development of free election among a multifarious array of subjects. Elections are supposed to give every pupil an opportunity to secure subjects which especially appeal to him and are therefore supposed to be especially applicable to his needs. There is no question that earlier schools were far behind the times in curricular matters. On the other hand, the psychology underlying the assumption that pupils tend toward early specialization due to dominant interests is seriously in question. The writer has cumulative records on a large group of pupils which tend to show that early preferences are utterly lacking in permanence in by far the majority of cases. An article covering portions of this material was published in the March, 1919, number of *School and Society*. We would not go back to the earlier narrow curriculum because there is real value in a course of study enriched both as to individual subjects and as to subject-matter. We do seriously question the real contribution that the enriched curriculum as a single factor has made toward the solution of the problem of dealing with individual differences. It has a function to perform when taken in connection with certain other factors, but it is far from caring for the situation in itself.

Much has been done in the past few years toward determining the objectives to be attained by pupils in school. In this connection has developed the idea of maximum and minimum courses of study within the given subjects. No explanation here is necessary as to the meaning of the terms. This represents one of the most progressive movements toward the solution of the problem of caring for the individual so that he can get the most out of his school course and, at the same time, offer the least hindrance to his fellows in their securing a like maximal value. To be specific, modifications within the English course to fit the abilities of students by maximal and minimal requirements within the same general outline are to be preferred to differentiation of English into literature and composition for the academic students as contrasted with pure business English for the commercial students. Each group needs contact with both types of material. Likewise, the poorer students need contact with literature and the better with technical business English; each group needs such contacts in a degree to suit its own peculiar abilities. Further, each individual in each group should have his peculiar needs met. In courses arranged with objectives whose attainment is presupposed to be a matter of degree according to the abilities of the student, but whose main core is the same for all, we have the foundation for the common elements which are essential to the welfare and existence of a democracy, as well as the foundations for the intelligent participation of the individual in that democracy.

School systems are committing themselves to one or the other of the three methods mentioned above, usually to the exclusion of the other two. This is almost inexplicable shortsightedness. The three methods, instead of standing alone, should be united in the same system. Maximum and minimum courses function in their most natural way when they are applied in connection with subjects that really do function for groups of varying ability and of varying outlook on the future, especially when such groups have been scientifically determined by cumulative records and results from intelligence tests. Supervised study becomes an efficient method of procedure when the teacher realizes that she has a group of pupils with a mental caliber of relatively the same level and

therefore supposed to attain a clearly marked degree of efficiency in the subject she is endeavoring to teach them. Under such conditions, the supervised study period may be used for the benefit of all the pupils in giving to each the help he needs, in the way he needs it, on the points on which he needs it, at the time he needs it, and to the extent to which he needs it. Without such arrangement as to classification and degree of attainment, study supervision can be only sporadic; probably it will not be given to the pupils in amounts distributed according to their needs, and will fail to function as an effective means of classroom procedure. In such cases, we find the evidence which enables us to say that many pupils fare better by being allowed to do their own work without the interference of the teacher.

But how can we go about securing these desired conditions? Who can make out courses of study which will be applicable to groups differentiated according to ability? The answer is that such courses of study must be of the developmental type. They must be *growing* courses of study. Small beginnings may be made in any subject by teachers and principal in committees. The simplicity of procedure in elementary types of this kind of work makes one wonder why it has not been more widely used. The remainder of this paper will deal with one or two illustrations of such work.

In a brief on supervised study,¹ the writer said in part:

In developing technique for effectively supervising study, the teacher needs to consider:

I. General supervision for the class as a unit, that the teacher may

A. State for himself, in very definite and specific terms, the ultimate aims and results expected from his course:

1. In order that he may have a yardstick for purposes of measuring:
 - a)
 - b) The cumulative progress made in various parts of the course
 - c) The final acquirements of pupils at the end of the course
2.
3. In order that he may more effectively direct the questioning and thinking of the pupils

II. Specific instruction for individual pupils

A. That each pupil may receive the kind of assistance that he needs

B.

¹ *Midland Schools*, March, 1918.

C. When the need of such individual attention shall be indicated by:

1. Pupil's own questions
2. Pupil's errors as shown in:
 - a) Daily or periodic written work
 - (1) By means of actual tabulation of errors
 - (2) By general ideas relative to errors
 - b) Board work
 - c) Written tests
 - (1) By means of tabulation of errors
 - (2) By general ideas relative to errors

The illustrations below represent special cases of the written test. In observing and tabulating errors of work in algebra, it became very evident to the writer that the "written problems" were the source of greatest difficulty for the majority of pupils. After this discovery he spent considerable time in visiting algebra classes and in attempting to find clues to the difficulty. He observed that in problems involving such purely arithmetical terms as "sum," "product," "quotient," "multiplicand," etc., many of the pupils apparently did not grasp the significance of the words. An attempt was made to find how much of a factor such terms actually constitute in success or failure in algebra. At this point the suggestion came that here was a case in which teachers should be interested in the *individual status of every pupil* in the algebra classes. A list of the terms which the writer considered indispensable knowledge for every pupil for his further work in mathematics and for his use in actual life was drawn up and submitted for criticism to the teachers of seventh- and eighth-grade arithmetic and also to the high-school and junior-college teachers of mathematics. By mutual agreement, some of the writer's terms were canceled and a few new terms were added. The final list contained thirty-five terms, arranged by chance distribution in the following order: triangle, proportion, profit, remainder, difference, dividend, subtrahend, fraction, insurance, premium, net proceeds, tax, amount, rate, polygon, square, decimal, mixed number, factor, sum, improper fraction, cube, multiplier, commission, base, quotient, interest, loss, percentage, multiplicand, divisor, complex fraction, ratio, product, trade discount.

These terms were then run off in duplicate copies with plenty of space for the answer after each term. The instructions at the head of the test sheet were: "What do you understand by the following terms? Either tell what you think each one means or illustrate it in a problem." In class the additional direction was given that if anyone wished to answer by drawing a figure he might do so. No time limit was placed on the test. Most pupils took less than fifteen minutes in answering. Objections may and probably should be raised to some of the terms included, but all would agree on many of them. Minor differences of opinion are immaterial for our present purpose.

The data having been collected, the next move was to put them in usable form. A very simple means of aggregating the material was used, and yet one that revealed to teacher, principal, and pupil alike the point of the individual's weakness or failure. Below is shown a sample check sheet. The numbers at the top correspond to the order of the terms given earlier. A perfect score was arbitrarily called "10," a failure "0," a failure to attempt an answer "X," and a doubtful answer "?."

SAMPLE CHECK SHEET—ARITHMETIC VOCABULARY

	PROBLEMS													Total			
	1	2	3	4	5	6	7	8	9	10	.....	35	0	X	?		
John Anderson.....	10	10	10	0	X	10	?	10	?	0	.....	.....	.....	.....	.....	.....	.....
John Jones.....	10	?	X	X	X	0	10	10	?	0	.....	.....	.....	.....	.....	.....	.....
John Smith	10	10	0	X	X	0	10	10	?	0	.....	.....	.....	.....	.....	.....	.....

The check sheets revealed both individual and group weaknesses in the command of essential arithmetical terms. Each pupil now had his own needs indicated. He needed to waste no further time with terms on which he had made 10, but did need to pay attention to the others. His first duty was to straighten out all terms concerning which there was a *question mark*; 0's followed and X's came next. The teacher had revealed to her what subjects she needed to teach again as subjects, and what ones might be omitted except for occasional review. Likewise, she had revealed to her the individual needs of every pupil. These tests were given about two months before the end of the year in order

that deficiencies in technical vocabulary might be removed. They will be given again early next year in the ninth-grade mathematics classes in order to discover any serious deficiency still persisting, such as failure to know the terms "sum" and "product." Pupils are much interested in working out their own problems if their individual deficiencies are clearly revealed to them.

Some interesting side lights on the lack of definiteness, even in our adopted textbooks in mathematics, develop from the study. In the same texts, the terms "difference" and "remainder" are synonymous at times and at other times have distinctly varying meanings. "Dividend" stands for two distinct ideas, as does also "base." Common also is an absolute disregard for the technical meaning of "amount." Even the terms "sum" and "product" have become somewhat tangled in certain texts. When mathematics teachers, through such investigations, begin to see that such conditions of indefiniteness exist, the difficulties of individual pupils can be more effectively met.

What is true in mathematics is also true in other subjects, probably to a greater extent. Much of formal grammar has been rightly eliminated from our elementary work, but a minimum of it should be included in the education of every boy and girl at least for corrective and interpretative purposes. When a pupil enters the ninth grade his English teacher assumes that he has a certain amount of information in English and that one part of such information is an exact understanding of certain technical terms. With this idea in mind, we attempted to make out a minimal technical vocabulary list which a ninth-grade teacher might rightly expect the pupil to know. In reality, such teachers have carried on their instruction in this technical vocabulary from time immemorial. The list was made up in the same way as was the arithmetic list. It was similarly given, scored, and used. The list was finally arranged in this order: simple sentence, singular number, past tense, preposition, noun, conjunction, plural number, sentence, relative pronoun, verb, participle, pronoun, modifier, active voice, semicolon, dependent clause, apostrophe, compound sentence, predicate, nominative case, object complement, colon, subjective complement, passive voice, independent clause, adjective, infinitive, adverb,

proper noun, subject, possessive case, complex sentence, period, comma, future tense.

Instructions were: "Explain what you understand by the following terms. You may either give a definition of the terms, or illustrate them in sentences, underlining the part that illustrates the term." Only one comment need be made on the results of this study. Strange as it may seem, there appeared to be more unanimity in the understanding of the English terms, and greater exactness in comprehending the meaning of the English terms than of the mathematical terms. In the course of the investigation, however, we discovered that teachers in the same grades had radically different ideas of the meaning of the terms "participle" and "infinitive."

What has been done in these subjects should be done in every subject, not only as a propaedeutic test, but also as a measure of the grasp of the technical vocabulary in every subject. For example, when the pupil sees that according to newspaper accounts an earthquake has occurred in Los Angeles, he needs to know what the term earthquake signifies. Likewise, when he hears of the probable scarcity of petroleum products, he needs to know the meaning of petroleum. A geometry teacher worked out a list of seventy-five terms that a student who has completed plane geometry should know. Only with the greatest difficulty could this teacher correct and tabulate the papers, because of the eagerness of individual pupils to find out not *how much they made* but *what they had wrong*. It furnished an individually motivated review.

But in our zealotry over these small details, we must not forget that the best opportunities for individual progress come through the three factors of (1) classification according to ability, (2) extended and enriched course of study and curricula, and (3) minimum and maximum courses or requirements in courses. If pupils have been classified according to ability, their records within each class will be largely the same. There will be differences among individuals as to the exact terms with which they are not familiar, but there will be no great variation in the number of subjects or terms each individual needs to straighten out. Furthermore, in the better groups very little time will be required to give the

requisite directions to individuals. On the other hand, much time must be used in dealing with the slower divisions; there will always be actually more to do in those divisions. In a properly organized school, the better divisions will be allowed to progress by taking up new work as soon as difficulties are removed; the classes as groups may be progressing long before every individual has his personal difficulties removed, and each individual may be making up his deficiencies.

A concrete illustration of the difficulty of dealing with such a situation can be seen by comparing the best individual record of the A division in the arithmetic tests, namely, two wrong, one of which was only a questionable wrong, with the best case and the worst case in the C class, which were, respectively, sixteen out of thirty-five wrong and twenty-one out of thirty-five wrong. Similarly, in the A division in English, the best record was none wrong, and the poorest five wrong out of thirty-five, while in the poorest division the best record was eleven out of thirty-five wrong, and the worst twenty-four out of thirty-five wrong.

Apparently, when we arrange our classes according to the alphabetical order, we handicap our teacher and pupils as effectively as if we had hobbled them with ball and chain. In reality the country school with its interminable number of classes is hardly so handicapped because there, due to the multiplicity of varying abilities, everyone expects individual progress. On the contrary, when fifty pupils of nondescript abilities are thrown together in a city seventh grade, individuality must be repressed in order to make the common machinery move.